

### Effect of dioxin on redox processes

V.N. Ivanov, S.N. Dimova

Department of Biochemistry, Medical Institute, Chita, Russia

Classic dioxin is a substance universally recognized as an absolute toxin. It exerts a much stronger action than cyanides, strychnine, curare and the now prohibited for use soman, sarin, VX-gas. Its chemical formula is represented as a combination of two atoms of oxygen with two benzoic rings each of which is bound with two atoms of chlorine. Classic dioxin is one of the most toxic of the 22 possible isomers of Cl<sub>4</sub>-dibenzo-paradioxins. The dioxin molecule has a rectangular form 3 x 10 Å in size, which enables it to perfectly fit into the receptors of the living organisms. In view of this fact it is of great interest to study the physiologic activity of this substance. It has been found that dioxin inhibits processes of tissue respiration. This phenomenon was studied on such vital organs as the liver, heart, kidneys, spleen. According to the data obtained the heart demonstrated inhibition of tissue respiration produced by dioxin exposure by 73.6 %, liver – by 75.7 %, kidneys – by 70.8 %, the spleen – by 65.3 %. The mechanism of this action was clarified by studying the dioxin effect on the key enzymes of the Krebs cycle. Dioxin was found to depress activity of succinate dehydrogenase in the organs studied by 52.3 – 74.5 %, activity of  $\alpha$ -ketoglutarate dehydrogenase – by 47.7 – 85.3 %, and activity of lactate dehydrogenase – by 59.6 – 81.5 %. To sum up, dioxin is a toxic substance with a wide spectrum of biological action, inhibiting tissue respiration and depressing activity of the key enzymes of the Krebs cycle.